PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : A61B 5/00 — A1

(11) International Publication Number: **WO 00/06017**

(43) International Publication Date: 10 February 2000 (10.02.00)

(21) International Application Number: PCT/US99/17204

(22) International Filing Date: 28 July 1999 (28.07.99)

(30) Priority Data:
60/094,715 30 July 1998 (30.07.98) US

(71) Applicant *(for all designated States except US)*: UNIVERSITY OF VIRGINIA PATENT FOUNDATION [US/US]; Suite 1–110, 1224 West Main Street, Charlottesville, VA 22903 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: BEACH, James, M. [–/US]; Charlottesville, VA (US). TIEDEMAN, James, S. [–/US]; Charlottesville, VA (US).

(74) Agent: SUFFREDINI, Brian, R.; University of Virginia Patent Foundation, Suite 1–110, 1224 West Main Street, Charlottesville, VA 22903 (US).

(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published

With international search report.

Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: IMAGING OCULAR VESSEL OXIMETER

(57) Abstract

An apparatus for evaluating oxygen utilization in posterior pole tissue of an eye includes a fundus camera (10) capable of generating an intermediate image of blood vessels in an eye, a beam splitting assembly (12) comprising a first bandpass filter (14), a second bandpass filter (15), a beam splitting (55) capable of splitting the intermediate image generated by the fundus camera into first, second images, an electronic imaging device (16) capable of electronically recording the first, the second images after the first, the second images have passed through the first, and second bandpass filters. The first, and second bandpass filters have respective first, second wavelength chosen to optimize the blood oxygen saturation imaging capability of the electronic imaging device. A method for evaluating oxygen utilization in posterior pole tissue of an eye includes reflecting a light beam off of blood vessels in an eye to create an intermediate image, and splitting the intermediate image into first, second images which are filtered such that the first, the second images have respective first, and second wavelength which optimize the electronic recording with respect to blood oxygen saturation. Empirical relationships between oxygen saturation, and optical density are utilized to obtain oxygen saturation values for a given subject.